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COMMUNICATIONS

THE INFLUENCE OF CALCIUM CHLORIDE ON THE PRODUCTION OF OCULAR FLUID AND ON OCULAR PRESSURE

BY

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The experiments of Chiari and Januschke[1] have already shown that injections of calcium chloride have the property of inhibiting or preventing the chemosis which appears after the instillation of a drop of mustard oil into the eye of a rabbit. This action may be attributed to a lesser permeability of the walls of the vessels. It would, therefore, not be surprising to find that the walls of the *intraocular* blood-vessels also become less permeable, and that, consequently, a limitation of the production of fluid in the anterior part of the eye takes place. A few investigations made in this direction strengthen this point of view.

Wessely[2] found that the administration of calcium chloride lessens the secretion of albumen found, after the instillation of eserin, in the ocular fluid.

Rosenow[3] introduced aseptic copper into the anterior chamber of an eye and found that an exudation forms in from 24 to 36 hours. If, however, calcium chloride has been previously administered parenterally only a little fibrin is formed.

Tristaino[4] found *tonometrically* that after subcutaneous injection of calcium chloride in rabbits the ocular pressure fell to 6 mm. Hg.

Kleiber[5] found that the introduction of calcium chloride into the anterior chamber or vitreous was followed by a subsequent lowering of the ocular pressure.

In order to obtain more reliable results we have found it necessary to observe the influence of calcium chloride *manometrically*. In the intact eye it is only possible to measure the tension which, however, may be dependent on different circumstances, so that it is impossible to make any accurate deductions from such measurements on the intraocular secretion.

It seemed preferable to measure the liquid-current which takes place when the eye is connected with a manometer in which there is a slight under-pressure, and then to ascertain whether the current changes under the influence of calcium chloride. It is also advisable to measure the blood pressure. The apparatus used (Fig. 1) is that described in Steyn's Dissertation[6]. It consists principally of a horizontal glass tube marked in millimetres in which the displacement of the liquid is indicated by a small air bubble. To the extreme ends of the horizontal tube are attached two vertical glass tubes with wide lumen by means of which the pressure can be kept constant in the manometer and the air bubble can be brought to any desired part of the horizontal tube during the experiment. The prevailing pressure in the eye can be measured at any moment by means of a mercury manometer attached to the horizontal tube. The apparatus is mainly a Leber's filtration manometer.

The amount of liquid that was displaced per minute from the eye of rabbits under urethane narcosis was carefully noted for ten minutes with the pressure in the manometer from 5 to 10 mm. Hg. below the intraocular pressure at the beginning of the experiment. If the amount of liquid displaced per minute remained constant as also the blood pressure for the ten-minute period, 6 c.c. of the .5 per cent. solution of anhydrous calcium chloride was injected into the iliac vein. The displacement of the air bubble and the oscillations of the blood pressure were then noted carefully and continuously.

It was then observed as can be seen from the curve (Fig. 2) that during an average of twenty minutes after the injection of calcium chloride the production of ocular fluid was considerably increased. This period of increased production was followed by a period of distinct decrease of production of much longer duration. This decrease could be noted during one and a half to two hours, beyond which period it was not found practical to continue the experiment. This initial increase and subsequent decrease of fluid production takes place independently of the blood pressure, since the blood pressure falls directly after the injection, but soon regains its original height and remains at this level for the rest of the experiment.

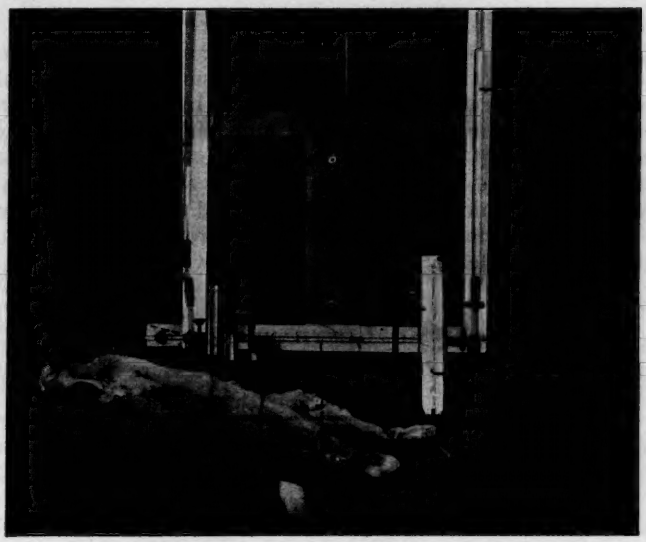

FIG. 1.

Measuring Liquid Displacement

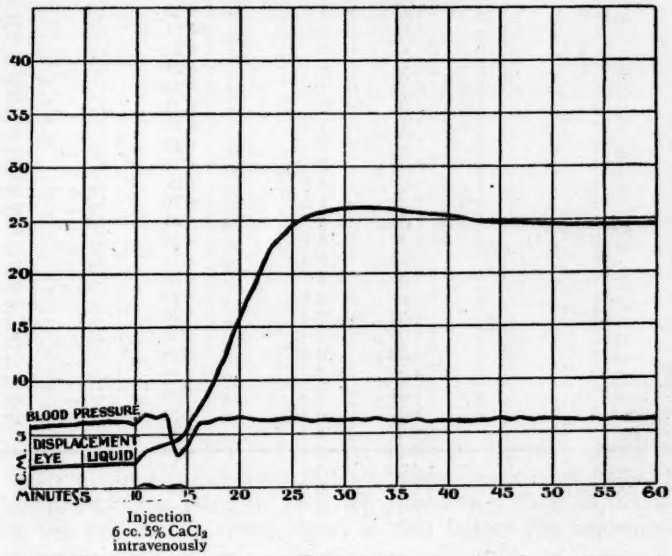

FIG. 2.

The same result follows when the experiment is performed in a slightly different way, namely by connecting the eye with a manometer in which there is a higher pressure than that in the eye, so that fluid is displaced into the eye. In these experiments the pressure in the manometer was 31 mm. Hg., an over-pressure of about 6 mm. Hg. We then observed that immediately after the calcium chloride injection a period followed during which the displacement of liquid into the eye ceased, and that the current was even reversed, so that fluid was displaced from the eye into the manometer, as is clearly shown in the following tables:

TABLE I

RABBIT 1·5 KG. URETHANE NARCOSIS.

Original eye pressure 25 mm. Hg. Over pressure in manometer 6 mm. Hg.

Displacement of liquid per min.		Displacement of liquid per min.		Displacement of liquid per min.	
3.01 p.m.	2 mm.³ p. min.	3.37 p.m.	11 mm.³ p. min.	4.12 p.m.	1 mm.³ p. min.
3.02 ,,	2 ,, ,,	3.38 ,,	— 9 ,, ,,	4.13 ,,	1·5 ,, ,,
3.03 ,,	1·5 ,, ,,	3.39 ,,	—10 ,, ,,	4.14 ,,	1 ,, ,,
3.04 ,,	2 ,, ,,	3.40 ,,	— 8 ,, ,,	4.15 ,,	1 ,, ,,
3.05 ,,	2·5 ,, ,,	3.41 ,,	— 7 ,, ,,	4.16 ,,	1 ,, ,,
3.06 ,,	3 ,, ,,	3.42 ,,	— 7 ,, ,,	4.17 ,,	1 ,, ,,
3.07 ,,	2·5 ,, ,,	3.43 ,,	— 6 ,, ,,	4.18 ,,	1·5 ,, ,,
3.08 ,,	2·5 ,, ,,	3.44 ,,	— 6 ,, ,,	4.19 ,,	1·5 ,, ,,
3.09 ,,	2·5 ,, ,,	3.45 ,,	— 3 ,, ,,	4.20 ,,	1·5 ,, ,,
3.10 ,,	3 ,, ,,	3.46 ,,	— 5 ,, ,,	4.21 ,,	1·5 ,, ,,
3.11 ,,	4·5 ,, ,,	3.47 ,,	— 4 ,, ,,	4.22 ,,	1 ,, ,,
3.12 ,,	3·5 ,, ,,	3.48 ,,	— 2 ,, ,,	4.23 ,,	1·5 ,, ,,
3.13 ,,	2·5 ,, ,,	3.49 ,,	— 3 ,, ,,	4.24 ,,	1 ,, ,,
3.14 ,,	4 ,, ,,	3.50 ,,	— 3 ,, ,,	4.25 ,,	1 ,, ,,
3.15 ,,	4 ,, ,,	3.51 ,,	— 2 ,, ,,	4.26 ,,	2 ,, ,,
3.16 ,,	4 ,, ,,	3.52 ,,	— 2 ,, ,,	4.27 ,,	3 ,, ,,
3.17 ,,	4 ,, ,,	3.53 ,,	— 2 ,, ,,	4.28 ,,	2 ,, ,,
3.18 ,,	4 ,, ,,	3.54 ,,	— 1·5 ,, ,,	4.29 ,,	2 ,, ,,
3.19 ,,	1 ,, ,,	3.55 ,,	— 1·5 ,, ,,	4.30 ,,	1·5 ,, ,,
3.20 ,,	1 ,, ,,	3.56 ,,	— 1 ,, ,,	4.31 ,,	1·5 ,, ,,
3.21 ,,	0·5 ,, ,,	3.57 ,,	— 0·5 ,, ,,	4.32 ,,	2 ,, ,,
3.22 ,,	— 8·5 ,, ,,	3.58 ,,	— 0·5 ,, ,,	4.33 ,,	2 ,, ,,
3.23 ,,	—25 ,, ,,	3.59 ,,	0 ,, ,,	4.34 ,,	1·5 ,, ,,
3.24 ,,	—23 ,, ,,	4.— ,,	— 0·5 ,, ,,	4.35 ,,	2 ,, ,,
3.25 ,,	—23 ,, ,,	4.01 ,,	— 0·5 ,, ,,	4.36 ,,	2 ,, ,,
3.26 ,,	—22 ,, ,,	4.02 ,,	0 ,, ,,	4.37 ,,	2 ,, ,,
3.27 ,,	—21 ,, ,,	4.03 ,,	0·5 ,, ,,	4.38 ,,	1·5 ,, ,,
3.28 ,,	—20 ,, ,,	4.04 ,,	0 ,, ,,	4.39 ,,	2 ,, ,,
3.29 ,,	—21 ,, ,,	4.05 ,,	0·5 ,, ,,	4.40 ,,	2 ,, ,,
3.30 ,,	—18 ,, ,,	4.06 ,,	0·5 ,, ,,	4.41 ,,	2 ,, ,,
3.31 ,,	—15 ,, ,,	4.07 ,,	0·5 ,, ,,	4.42 ,,	2 ,, ,,
3.32 ,,	—12 ,, ,,	4.08 ,,	0·5 ,, ,,	4.43 ,,	2 ,, ,,
3.33 ,,	—11 ,, ,,	4.09 ,,	1 ,, ,,	4.44 ,,	,, ,,
3.34 ,,	—11 ,, ,,	4.10 ,,	0·5 ,, ,,	to	
3.35 ,,	—10 ,, ,,	4.11 ,,	1 ,, ,,	5.— ,,	2 ,, ,,
3.36 ,,	— 9 ,, ,,				

6 ccm. 5% $CaCl_2$ injection in iliac vein

TABLE II

RABBIT 2 KG. URETHANE NARCOSIS.

Original Eye pressure 20 mm. Hg. — Blood pressure 90 mm. Hg. in iliac artery.

Displacement of liquid per min.	Blood pressure	Displacement of liquid per min.	Blood pressure
2.53 p.m. 3 mm³. p. min.	90 mm. Hg.	3.37 p.m. —9 mm³. p. min.	84 mm. Hg.
2.54 ,, 4 ,, ,,	90 ,,	3.38 ,, —8 ,, ,,	84 ,,
2.55 ,, 3 ,, ,,	90 ,,	3.39 ,, —7 ,, ,,	82 ,,
2.56 ,, 4 ,, ,,	90 ,,	3.40 ,, —4 ,, ,,	84 ,,
2.57 ,, 4 ,, ,,	90 ,,	3.41 ,, —6 ,, ,,	86 ,,
2.58 ,, 3 ,, ,,	90 ,,	3.42 ,, —8 ,, ,,	90 ,,
2.59 ,, 3 ,, ,,	90 ,,	3.43 ,, —5 ,, ,,	90 ,,
3.— ,, 4 ,, ,,	90 ,,	3.44 ,, —2 ,, ,,	88 ,,
3.01 ,, 4 ,, ,,	90 ,,	3.45 ,, —2 ,, ,,	86 ,,
3.02 ,, 3 ,, ,,	90 ,,	3.46 ,, —3 ,, ,,	90 ,,
3.03 ,, 4 ,, ,,	60 ,,	3.47 ,, —3 ,, ,,	90 ,,
3.04 ,, 4 ,, ,,	70 ,,	3.48 ,, —2 ,, ,,	90 ,,
3.05 ,, 3 ,, ,,	70 ,,	3.49 ,, —1 ,, ,,	90 ,,
3.06 ,, 5 ,, ,,	60 ,,	3.50 ,, —2 ,, ,,	88 ,,
3.07 ,, 4 ,, ,,	60 ,,	3.51 ,, —1 ,, ,,	92 ,,
3.08 ,, 3 ,, ,,	60 ,,	3.52 ,, 1 ,, ,,	94 ,,
3.09 ,, 3 ,, ,,	60 ,,	3.53 ,, 1 ,, ,,	88 ,,
3.10 ,, 5 ,, ,,	65 ,,	3.54 ,, 3 ,, ,,	96 ,,
3.11 ,, 5 ,, ,,	65 ,,	3.55 ,, 2 ,, ,,	88 ,,
3.12 ,, 4 ,, ,,	68 ,,	3.56 ,, 2 ,, ,,	88 ,,
3.13 ,, 4 ,, ,,	70 ,,	3.57 ,, 0 ,, ,,	98 ,,
3.14 ,, 3 ,, ,,	70 ,,	3.58 ,, 1 ,, ,,	100 ,,
3.15 ,, 4 ,, ,,	74 ,,	3.59 ,, 0 ,, ,,	100 ,,
3.16 ,, 3 ,, ,,	72 ,,	4.— ,, 2 ,, ,,	98 ,,
3.17 ,, 1 ,, ,,	74 ,,	4.01 ,, 0 ,, ,,	98 ,,
3.18 ,, 1 ,, ,,	78 ,,	4.02 ,, 2 ,, ,,	98 ,,
3.19 ,, 0 ,, ,,	76 ,,	4.03 ,, 1 ,, ,,	98 ,,
3.20 ,, — 1 ,, ,,	76 ,,	4.04 ,, 3 ,, ,,	98 ,,
3.21 ,, — 3 ,, ,,	76 ,,	4.05 ,, 4 ,, ,,	98 ,,
3.22 ,, — 4 ,, ,,	74 ,,	4.06 ,, 1 ,, ,,	92 ,,
3.23 ,, — 5 ,, ,,	76 ,,	4.07 ,, 3 ,, ,,	96 ,,
3.24 ,, — 6 ,, ,,	76 ,,	4.08 ,, 1 ,, ,,	96 ,,
3.25 ,, — 6 ,, ,,	78 ,,	4.09 ,, 2 ,, ,,	88 ,,
3.26 ,, — 7 ,, ,,	80 ,,	4.10 ,, 1 ,, ,,	88 ,,
3.27 ,, — 8 ,, ,,	80 ,,	4.11 ,, 1·5 ,, ,,	86 ,,
3.28 ,, —10 ,, ,,	80 ,,	4.12 ,, 2·5 ,, ,,	90 ,,
3.29 ,, —16 ,, ,,	82 ,,	4 13 ,, 3 ,, ,,	88 ,,
3.30 ,, —14 ,, ,,	82 ,,	4.14 ,, 3 ,, ,,	88 ,,
3.31 ,, —18 ,, ,,	84 ,,	4.15 ,, 2 ,, ,,	86 ,,
3.32 ,, —19 ,, ,,	84 ,,	4.16 ,, 3 ,, ,,	84 ,,
3.33 ,, —17 ,, ,,	84 ,,	4.17 ,, 2 ,, ,,	88 ,,
3.34 ,, —17 ,, ,,	86 ,,	4.18 ,, 2 ,, ,,	88 ,,
3.35 ,, —12 ,, ,,	84 ,,	4.19 ,, 3 ,, ,,	88 ,,
3.36 ,, —10 ,, ,,	84 ,,	4.20 ,, 2 ,, ,,	86 ,,

(6 ccm. 5 % $CaCl_2$ injected in iliac vein.)

After about half an hour this increased production ceases and a decrease takes place to such an extent that fluid is displaced into the eye with a speed equal to that before the injection of

calcium. Since the previous experiments show that a decrease of fluid production takes place at this stage, it seems reasonable to expect that in experiments with an "over-pressure" manometer a greater quantity of liquid would be displaced into the eye than before the calcium injection. That this does not happen probably

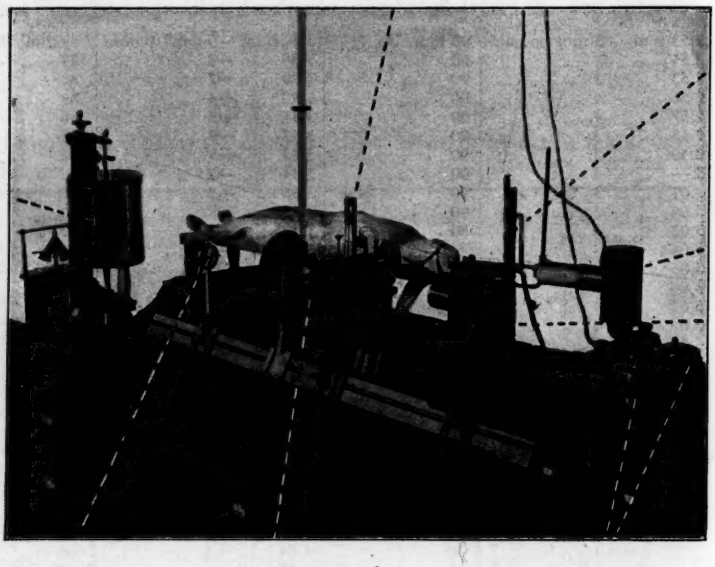
Mercury manometer
Kymograph
Cylinder lens + 12 to turn horizontal air bubble vertical (Method DE WAARD)
Registration manometer of ROCHAT
Resistances for Pointolite-lamps

FIG. 3.

Registration of the ocular pressure.

indicates that there is a lesser permeability of the draining apparatus of the anterior chamber (canal of Schlemm, etc.).

We further investigated whether, as a result of calcium injection, there was actually any change of pressure in the intact eye. For this purpose the eye was connected with Rochat's sensitive registration manometer (*Arch. néerlandaises de Physiologie*, Vol. VII, p. 265, 1922) so that the ocular as well as the blood pressure could be simultaneously recorded photographically as seen in the curve reproduced (Fig. 4).

The results corresponded with those of the foregoing experiment. Immediately after the intravenous injection of calcium chloride the intraocular pressure rose to about 45 mm. Hg. for a period of about half an hour and then gradually fell well below the normal pressure during the rest of the experiment, which lasted about an hour. It is not practical to continue the experiment much longer as abnormal changes take place in the eye after that time, such as redness, and clotting in the canula connecting the eye with the manometer. We, therefore, considered

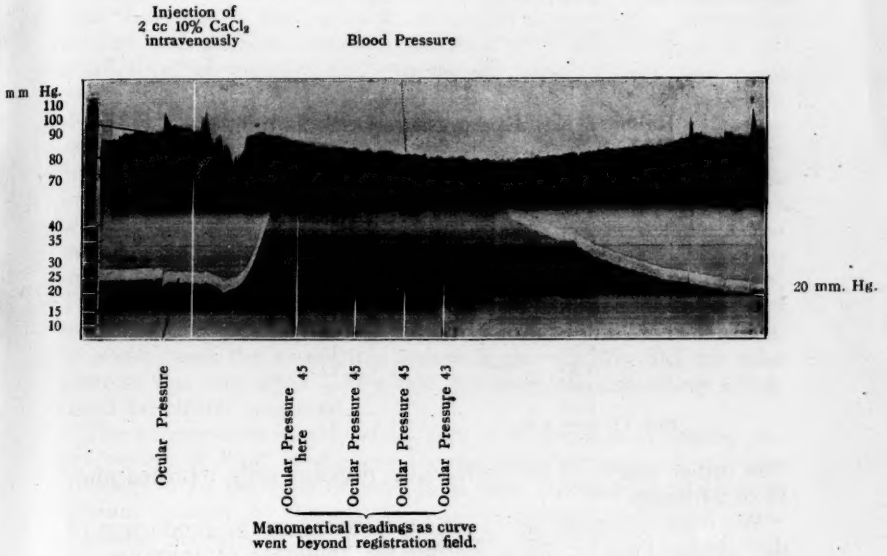

FIG. 4.

Influence of $CaCl_2$ injection on eye—and blood pressure

it necessary to extend the experiments with the assistance of a tonometer, which, however, is less accurate but has the advantage that the experiments can be extended over an unlimited space of time.

A curve had first to be constructed for the Schiötz tonometer for the rabbit's eye, as the curve for the human eye is not suitable for that of the rabbit.

Tonometrically it also appeared that, immediately after the calcium injection, the tension was raised for a short period to be followed by an abnormally low pressure which could be observed for many hours as seen in the following tables.

TABLE III

Rabbit 1·75 Kg. Eye pressure 25 mm. Hg.

26-3-'23	3.— p.m.	2 c.cm. 10 % $CaCl_2$ injected in ear vein.		
	3.08 ,,	eye pressure	30	mm. Hg.
	3.20 ,,	,,	18	,,
	3.30 ,,	,,	14	,,
	3.45 ,,	,,	12	,,
	4.30 ,,	,,	13	,,
	5.— ,,	,,	12	,,
	8.— ,,	,,	13	,,
27-3-'23	9.— a.m.	,,	20	,,
	2.— p.m.	,,	25	,,
	5.— ,,	,,	20	,,
28-3-'23	9.— a.m.	,,	25	,,

TABLE IV

Rabbit 3 Kg. Eye pressure O. S. 22 mm. Hg.

28-9-'23	3.— p.m.	5 c.cm. 5% $CaCl_2$ injected in ear vein.		
	3.03 ,,	eye pressure	O. S. 35	mm. Hg.
	3.05 ,,	,,	,, 35	,,
	3.07 ,,	,,	,, 40	,,
	3.10 ,,	,,	,, 35	,,
	3.15 ,,	,,	,, 25	,,
	3.20 ,,	,,	,, 20	,,
	3.30 ,,	,,	,, 16	,,
	3.40 ,,	,,	,, 14	,,
	4.— ,,	,,	,, 13	,,
	4.15 ,,	,,	,, 12	,,
	4.30 ,,	,,	,, 12	,,
	5.— ,,	,,	,, 12	,,
	6.— ,,	,,	,, 13	,,
29-9-'23	9.— a.m.	,,	,, 22	,,

The initial height of the intraocular pressure only returned after 12 to 24 hours.

We made a further series of experiments on the production of the ocular fluid by investigating the influence of injection of calcium on the secretion of fluorescin in the anterior chamber. The injection of 1 c.c. of a 3 per cent. solution of uranin intravenously into the ear of a rabbit causes after some time the appearance of the so-called line of Ehrlich. Long before this, however, we can see with the help of the slit-lamp and corneal microscope a green fluorescence in the anterior chamber. The intensity of the colour may be estimated, though only approximately, by placing in front of the slit-lamp small tubes containing a much diluted solution of uranin of different strengths and comparing their colour with that appearing in the anterior chamber.

We found that the injection of calcium chloride accelerates the appearance of the green colour in the intraocular fluid. The animals in which calcium had been injected exhibited fluorescence

in the anterior chamber sooner than the control animals and the green colour got more intense and could be perceived longer in the former. This is in agreement with the results obtained by the previously described methods of experimentation.

Lastly, we repeated the experiments of Chiari and Januschke[1]. These observers found that injections of calcium chloride had a pronounced inhibitory effect on the oedema produced by the action of mustard oil. Their experiments have frequently been repeated by other observers. Our object in repeating their experiments was to test the observation made by Magnus, de Kleijn, and Storm van Leeuwen[7], that while it was true that rabbits previously treated with calcium chloride exhibited very little reaction on the instillation of mustard oil into the conjunctival sac, they were afterwards much worse off than the control animals, as they developed panophthalmitis with phthisis bulbi instead of severe oedema. Our experiments did not confirm this observation. We found that the animals treated with calcium as well as the control animals developed corneal ulcers which healed after a few days whether the application of mustard oil was followed by oedema or not. Nothing was seen of a more severe course of the affection in the animals which had been protected by the calcium injection. The general condition, however, of the protected animals was worse, as they got extensive necrosis of the skin and became thin. In some cases the protecting action of the calcium did not take place or was very weak. As a rule, however, the protecting action could be clearly observed.

The experiments clearly show that it is possible to inhibit the production of fluid in the eye by the administration of calcium chloride. In the case of man it is only possible to administer calcium chloride by the mouth, as subcutaneous injections cause extensive necrosis of the skin, and intravenous injections of any considerable quantity are dangerous on account of their action on the heart. Further investigations must teach us how far it is possible in the case of man to inhibit the production of intraocular fluid by intestinal administration of calcium chloride.

It is necessary to distinguish between two clearly different actions of calcium chloride on the production of ocular fluid, the one inhibiting and the other promoting the production. The former can be readily explained by the facts already known about the action of calcium in general, i.e. it renders the walls of the blood-vessels less permeable and also causes contraction of the small blood-vessels. The latter on the contrary cannot be explained without recurring to theoretical suppositions, since it was not previously known that calcium chloride for a short time promotes the production of ocular fluid. Action on the nervous system of the eye is a possible explanation. There are vaso-constrictors, and,

in all probability, vaso-dilators in the eye. Bayliss has demonstrated their presence in the ophthalmic branch of the trigeminal nerve. It is also possible that calcium chloride (which according to Overton and Locke acts on the synapses of some nerves) by either paralysing the constrictors or stimulating the dilators causes an increased circulation in the eye, while the specific action of calcium chloride which causes constriction and lessens the permeability of the vessel walls is temporarily masked.

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AN ARABIC BRONZE NEEDLE FROM ANTIQUITY FOR DEPRESSION OF CATARACT

BY

S. HOLTH

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AMONG some antique surgical bronze instruments collected from the ruins of Palmyra by the late Russian Baron Ustinov (1872-1890) and now in my possession[6 and 3] there is one to which some interest for the history of ophthalmology is attached; it was exhibited at the Eleventh Annual Meeting of the Oxford Ophthalmological Congress, 1920. Baron Ustinov has never published anything about his finds.

In Fig. 1 the instrument is seen in natural size. Though the sharp end was broken off in antiquity and not found I have good reasons to believe that the instrument is an Arabic cataract couching needle from the centuries immediately after the Mohammedan conquest of Palmyra; in a spatula found from the same source a Palmyrene man's name *'Αδηάκαβος* is stamped *Ati'akab* in basso-relievo with Arabic letters[3 and 6].

I have the following facts to support my opinion:

(1) The diameter of the square handle, 4 mm., is about the same as in the ophthalmic instruments of the present day; I do not, however, lay great stress upon this point.

(2) The proportion between handle and shaft (Fig. 1) corresponds with some Arabian diagram pictures (Fig. 2) of needles for couching cataract from Abulqāsim's *textbook of* surgery (eleventh century); in spite of the prohibition of the Koran against images, the work is illustrated in the oldest manuscripts, perhaps by Christian copyists who have seen the Arabian instruments.

In the Latin translations of Abulqāsim (younger manuscripts and incunabel prints) the illustrations become more and more fantastic, while they are arbitrarily simplified in Leclerc's French translation[1], whose drawings were lent by Gurlt[4].

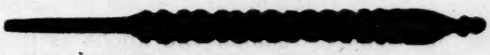

FIG. 1

The square handle of the bronze couching needle is photographed in natural size in such a position that one of the four edges is seen along the middle axis while the sawtoothed outlines of the upper and lower edges are seen in profile.

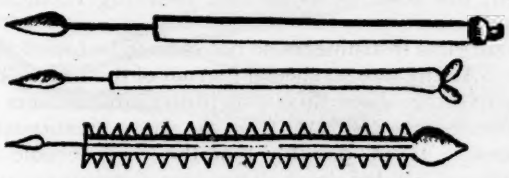

FIG. 2

The picture of the Channing Abulqāsim edition (1778) of three Arabic couching needles for cataract from M.S. Huntingdoniensis, No. 156, Bodleian Library, Oxford (After Karl Sudhoff.) [7].

From Fig. 1 will be seen the great resemblance between our instrument and the lowest picture in Fig. 2 from the Arabian MS. in Oxford. This fact makes me agree with Professor Hirschberg[5] that the sawtoothed outlines of the latter are only an unsuccessful drawing of the decoration of the handle. The same is the case with the reproduction of the stem of the instruments in the two lower pictures in Fig. 2 as a thin line; even made of steel they would have been too slender. Made of bronze the stem ought, like ours, to be 2 mm. The ancient authors say expressly that the cataract couching needle (always bronze) must be *strong*; for this reason the puncture with the cataract needle itself through the membranes of the eye was often difficult, and, therefore, performed by the Arabs with a scalpel point as the Mohammedan cataract couchers still do in India to-day (R. H. Elliot[2]).

(3) One end of the handle is provided with a knob of 2 mm. diameter, and seems likely to be made for a preparatory act in the depression such as is described by Antyllos, by Paullos Aiginetes and by many Arabian surgeons. Local anaesthetics were not known, the operation was painful; the eye made an escaping movement upwards so that the surgeon risked making a wrong puncture. In order to prevent this accident, both Greek and Arabian authors advised the operator first *to make with the knob of the handle a dent* in the surface of the eye where the puncture was to be made; then an incision with the scalpel point, and finally, the introduction of the couching needle. According to Hirschberg[5], Salah Ad-Din advised first to dip the knob into an antimonial paint by which the dent became a black spot.

According to Sudhoff[7] similar end knobs as those seen in Figs. 1 and 2 may be found as decorations on pictures of Arabic tooth instruments in the Latin incunabel editions; but none of those drawn in his work have "sawtoothed" outlines, and in the only one which could be considered (Bibl. 7, Fig. 32) only the handle is of bronze in which a steel instrument is placed. Our instrument, like all ancient cataract couching needles, is wholly of bronze.

Arabic surgical instruments do not seem to be found in European museums. At any rate no special journal of the history of medicine contains anything about this; and illustrated accounts of medical history contain only diagrams from the above-mentioned mediaeval manuscripts. It is possible that the very durable old bronze instruments are handed down to the next generations and are used to this very day. At any rate medical textbooks from the middle ages (in printed copies) are still in use by such Arabian physicians as have not acquired modern medical education from the French in Algiers and Beirut or from the English in Cairo.

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IMPROVED PUNCH FORCEPS FOR TANGENTIAL AND EXTRALIMBAL SCLERECTOMY IN CHRONIC GLAUCOMA

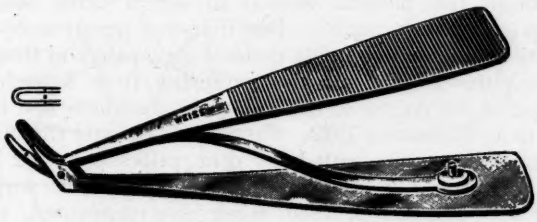
BY

S. HOLTH

CHRISTIANIA, NORWAY

A YEAR ago I made two improvements in my punch forceps with 1 mm. blade.

In the pattern of 1920 (*Brit. Jl. of Ophthal.*, Fig. 5, p. 547, 1921) the upper surface of the male blade was straight so that the sclera might slip and cause the sclerectomy to be only 1.5 mm. in length instead of 3 mm., which is always necessary. The instrument,



in that case had to be re-introduced in order to make a supplementary sclerectomy of 1.5 mm. In the improved pattern (see the figure) the upper surface of the male blade is made *concave* so that the sclera cannot slip out and a piece of sclera 1 by 3 mm. is immediately cut out.

A *black point* is marked on the upper surface of the male blade 4 mm. from the end, and, at the suggestion of my friend Mr. Mayou, *two transverse ridges* are made on the upper surface of the female blade, also 4 mm. from the end. The instrument is introduced until these marks are 1 mm. outside the median angle of the keratome incision; the resulting sclerectomy will then be 3 mm. in length.

The operation has now (from the spring of 1920 until the end of December, 1923) been performed here in Christiania in more than 200 cases of chronic glaucoma. Atropin is applied on the following day in order to prevent the formation of posterior synechiae. The lowering of the ocular pressure is good as in the other forms of sclerectomy, and, so far, no case of late infection has been observed.

A SURGICAL METHOD OF DEALING WITH KERATOCONUS

BY

GEORGE YOUNG

COLCHESTER

MISS D. G., aged 17 years, first consulted me about her eyes at the Essex County Hospital on November 2, 1921. Both corneae were intensely conical and thus very much thinned at the apices, the left one being far the more advanced and already showing signs of opacity from exposure at the apex. The right cornea was still clear.

R.V.: 6/36, c. - 2.0D sph. + 3.50D cyl. 155°; 6/18 pt., 6/12 pt., and shapes 6/9.

L.V.: fingers at 2 metres; empirical attempts here were of little avail, though the patient seemed to see a little better with - 2.0D sph. - 3.0D cyl. 125°. But that was purely subjective.

The patient was an extremely delicate girl, pale and thin, sallow skin, acne, brown hair and iris, suffering from bronchitis and asthma and in the course of the following treatment had broncho-pneumonia at Christmas 1922. From the first date till this attack she was treated steadily with 1 per cent. pilocarpin, and bandage at night. During her attack of pneumonia she interrupted her treatment till January 3, 1923, when she reappeared, with the whole central portion of the left cornea bulging between the eyelids, and in fact showing a staphyloma of the cornea the size of a large pea. Bursting was imminent, and I devised this operation with the view of attempting to save the eye, and carried it out on March 19, 1923. Of course there was no more form vision, and only movements could be seen.

The cornea was transfixed by four needles, entering the anterior chamber outside the base of the staphyloma, and issuing at a point symmetrically opposite, as shown in Fig. 1 and Fig. 2. For the two horizontal transfixions two ordinary fine sewing needles were used. For the two vertical ones curved needles had to be used, to escape the prominence of the supraorbital ridge. Two silk sutures were used. Each pair of needles were threaded with the two ends of one of these. Then each needle was drawn through and both sutures tied firmly, constricting the whole staphyloma at its base, like a purse string draws the mouth of a purse together and closes it; then the whole staphyloma was sliced off by means of a keratome and to and fro sawing movements of one of its sharp edges. Atropin and a light bandage were applied. The sutures were easily pulled out on the fifth day. Patient was discharged with atropin drops in a week. There was no reaction, and to my

surprise, the after treatment had been painless. I expected it to be very painful. Also the puckering of the cornea disappeared and smoothed down into a regular spherical surface in so brief a time, that inside of a month (I saw her for the first time after operation on April 8), no one would have suspected that abscission had been performed at all, there being only a stellate leucoma at the centre of the cornea. The peripheral portions of the cornea were clear. Two months later, June 18, I performed an optical iridectomy, down and in, as atropin dilatation of the pupil did not produce any dilatation downwards, the iris evidently having become adherent to the leucoma all along the lower portion. Upwards the pupil dilated in a sinuous bulge, only with no visual benefit, as it was covered by the eyelid, and for some reason, even

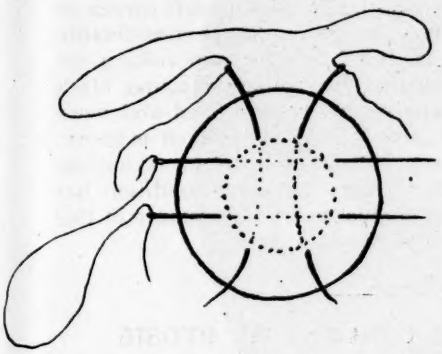


FIG. 1.

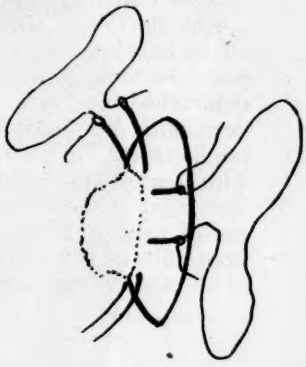


FIG. 2. Profile.

the raising of the eyelid produced no form vision. The result, however, of the optical iridectomy down and in was immediate. The vision, which was mere shadows before, was, immediately after the iridectomy, equal to correct counting of fingers, and two days after the operation, June 20, the vision was fingers at 4 metres, and the eye was quiet. The patient was discharged and kept under atropin *ter die*, and on July 4 visual tests were made at the hospital. The first attempt at correction was: L.V.: 6/60, c. – 1.50D sph. +2.0D cyl., axis 60°: 6/36.

This was a very rough test, and later the ophthalmometer showed a considerable astigmatism with the axis corresponding roughly to the direction of the coloboma, at about 45°, but not measurable in amount, though I endeavoured to take the measurement by fixing the eye so that the iridectomized portion of the cornea was opposite the telescope. But the visual result was remarkably good:

L. V.: 6/60, c. +1.0D sph. – 3.0D cyl. 45°: 6/24. And with

added plus lenses (eye being under atropin), J.2, fluently. This made her left eye equal, for distance, to her better eye, which is now getting worse owing to increased bulging, and will probably follow the course of the other one soon.

R.V.: 6/36, c.-1.0D sph.+3.50D cyl. 155°: 6/24 and J.5. Furthermore, it may be noted that the intraocular tension was now normal on the side of the iridectomy, while the right eye was hard, and I submitted it again to pilocarpin and bandage at night. I sent her home for a fortnight to feed up, take malt and cod liver oil and fats, and to take plenty of rest and recuperate. On July 8 the final result was:

L.V.: 6/36, c.-5.0D sph. +3.50D cyl. 160°: 6/12 full, and -3.0D sph. and +3.50D cyl. J.2.

Soon I shall tattoo the stellate leucoma with an artificial pupil.

May 10, 1924. Since writing the above, some ten months ago, affairs have kept steady. There is no bulging of the left cornea or scar. I attempted tattooing at two sittings, and have considerably diminished the glare of the scar, but I refrain from risking the deep tattooing necessary for securing an imitation round black pupil, fearing to do harm. Glasses were prescribed and worn with comfort and great help, the vision being maintained as above. The right eye still holds its own with miotics and an occasional use of bandage at night. The patient's general condition has been built up successfully and I emphasize the importance of this in all cases where debility or other causes require it.

AN OPERATION FOR CONGENITAL PTOSIS

BY

GEORGE YOUNG

COLCHESTER

ON July 17, 1923, Miss E. W., of Wivenhoe, consulted me about the condition of her right eye. Fig. 1 shows her appearance, due to the congenital absence of the levator palpebrae. The right face was distorted in the usual way by complete ptosis, absence of the palpebral fold, inability to raise the right eyelid, even with the frontalis muscle, which merely threw the forehead on the right side into multiple transverse folds, raising the right eyebrow three-quarters of an inch above the left, and productive of a continuous "tic"—the constant impulse to lift the lid sufficiently to let the right eye take part in the act of vision. Altogether a most disfiguring state to behold, in an otherwise graceful and attractive young woman. I will dwell only on the functional disturbance

and its surgical relief, but the psychological factor, so obvious, I leave to your reason. It was the most disturbing element, of wide-reaching importance, and caused the young girl nothing short of mental distress.

The rotators of the eyeball were normal. Operation had been mostly disadvised, the patient's ardent desire of an assurance of cosmetic success making this easy to see. It had been suggested

FIG. 1.

to use a strip of frontalis, but fortunately, I think, not carried out. Its functional result might be perfect, but its cosmetic success would be very imperfect, for it would have cured neither the "tic" nor the unequal level of the brows, nor their furrows. Motais' operation I considered, but it weakens the power of the already very weak superior rectus by one-third or more. Also it forms only a small central attachment at a single point. The first may well be the cause of ensuing diplopia, through limitation of power in looking up. The second is likely to cause a tent-like pulling

up of the centre of the eyelid, and sagging at the sides, particularly the temporal.

I thought out the following operation and venture to publish it because it has led to the best result I have ever obtained, both cosmetically and functionally, and is not followed by diplopia. Fig. 2 shows that all the disfiguring features are removed. The corrugations of the brow are smoothed out, the level of the two

FIG. 2.

brows is the same, the palpebral fold is there and looks natural, the movements are normal. At first there was some deficiency in nictitation, but this was soon removed by exercises in the mirror.

The operation, a long one, requires a general anaesthetic. It was thus performed on July 24. The superior rectus muscle was exposed for about one centimetre up its fleshy belly. With a strabismus hook the eyeball was depressed to the extent of a maximal contraction of the inferior rectus. The upper lid was now everted, and, where the upper edge of the tarsus crossed the

belly of the muscle, the latter was freshened transversely for its whole width with a sharp scalpel, by scraping it. Then the upper end of the tarsus was exposed exactly to the extent of the width of the muscle, and by means of three silk sutures, one taking in the central fibres of the muscle, the other two taking in the two edges, the whole width of the superior rectus muscle was firmly sutured to the tarsus. This fixes the central and nasal portions of the eyelid, but should the lateral part still sag, a point of attachment between the edge of the tarsus and the sclera can be added then and there, or later.

The lagophthalmos present immediately after operation does not last long, so it is not necessary to sew the edges of the eyelids together for a couple of days as I did. I left the sutures in place, as they did not irritate. I did not evert the lid for one month so as to run no risk of loosening the attachments. Firm union had set in, perfect *cul-de-sac*, without pockets for retention of secretions, and no trace of the sutures.

November is gone, I have seen the case once a month. All disfigurement is gone and movements are quite free, even blinking, for they have of course been religiously eliminated in front of the looking-glass. The trick of the brow persisted longest. It was still present at the end of October, and gave the impression only of being a quaint mannerism. It has now ceased entirely.

A persistent flush and lacrimation puzzled us, but was easily explained, when, exactly four months after operation, a suture made its appearance. In future I suggest bringing the three central, and also the lateral stitch, if one be used, through on to the outer surface of the eyelid, and tying them over glass beads.

The eye quieted down completely, all lacrimation has ceased, and now, May, 1924, the functional result and the appearance are excellent.

A CASE OF ECTOPIA LENTIS WITH COLOBOMA*

BY

D. V. GIRI

EASTBOURNE

HORACE B, aged 11, came under my observation as an out-patient at the Eastbourne Eye Infirmary on February 2, 1918.

The mother of the boy was unaware of his defective vision until she was advised by the school authorities to have his eyes seen to. A horizontal scar in the middle of the patient's forehead was caused

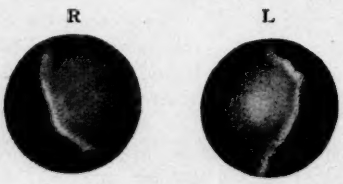
* Shown at the Annual Congress of the Ophthalmological Society of the United Kingdom in 1918.

by a fall in infancy. It appears the eyes were unaffected by the fall. The head was badly moulded. There was no history of difficult labour or instrumentation during delivery. The patient was the youngest of a family of eight children; all the others were said to have good eyes. There was no history of "bad eyes" either on the father's or on the mother's side.

The boy was nervous and given to jerky movements of the head.

Both eyes showed marked irido-donesis. Any difference in depth between one part and another of the anterior chambers could not be made out. The eyes looked normal in size and appearance. Pupils equal and active.

Lenses.—With undilated pupils the ophthalmoscope revealed the outer edges of the lenses which were displaced obliquely inward. Under mydriasis the visible outer contour of the lenses showed an angular notch in each lens, the right lens being notched below and the left above which showed two angles, though less



Magnified about 2 diameters. The lightly shaded parts represent the lenses.

pronounced than in the right. There was no apparent movement of the lenses with movements of the head. Even bending the head forward did not appear to alter their position. The lenses were clear.

I could not make out the zonular fibres in the aphakic area and it is said that in most cases they are almost wholly absent in that area. Though in view of this fact, the lenses may be expected to move when the head moves, at any rate in instances in which the intact zonular fibres cover only half or less than half the circumference of the lens, to my knowledge there is no record of movement having been looked for in previous cases.

The eyes were parallel. The refraction of the phakic area was about −12D and that of the aphakic area about +8D with which by direct ophthalmoscopy the discs and a fair amount of the adjoining background were clearly seen to be healthy.

R.V. < 5/60; L.V. < 5/60; not improved with glasses.

In this case there was no concomitant congenital anomaly, such as coloboma of the iris, corectopia, etc.

According to Parsons only two cases have been recorded of ectopia lentis with coloboma, one by Rogman, in which the lenses

were displaced downwards, and one by Marcus Gunn, in which the ectopia was upwards. The present case differs from them in that the displacement was obliquely inwards and the defects in the lenses were at opposite extremities of the exposed contours.

It was not merely as a clinical curiosity that I brought this case before the Congress. Seeing that there was no nystagmus and no squint, that the eyes were normal in appearance, the fundi healthy and the only chance of improving the vision, so far as I could see, consisted in needling the lenses and prescribing suitable glasses, I was inclined to render the eyes aphakic. As I was not aware of any instance of the kind where the suggested procedure had been adopted I wished to hear of such from the members of the Congress.

At the Congress one of the members stated that he had rendered the eyes aphakic in similar cases and obtained improvement of vision with correcting glasses. I have discovered since that Mr. Charles Wray had written a paper on discission in cases of ectopia lentis. In the above case I had to needle the lenses eight times altogether before they were completely absorbed. One needling proved sufficient in the case of the right lens, but the left lens required no less than seven discissions owing to the repeated closing of the capsule after the absorption of a few flakes actually released at the operation or protruding through the opening every time. The first needling of both lenses was done on February 17, 1918, the last needling of the left lens on February 16, 1919, its absorption becoming complete by February 26, 1919. On the latter date he was refracted and

R.V. $\bar{c}$+12D sph.+1D cyl. ax. 120° up and out was 5/24.

L.V. $\bar{c}$+13D sph. +2D cyl. ax. 60° up and out 5/24; binocularly 5/18 partly.

The patient was last seen by Mr. G. B. Lowe on December 31, 1923, nearly five years after the aphakic eyes were corrected. The refraction was found to be unchanged and with the original corrrection R.V. was 6/24 and L.V. 6/24. This leads one to think that in this case at any rate the growth of the eyes was complete at 11 years of age. A form of amblyopia was present in them and it was either already too late to acquire normal acuity of vision even with correction or there was an inherent incapacity to develop it.

Amblyopia of this kind has to be put in a class by itself. According to Worth both congenital amblyopia and amblyopia ex anopsia are uniocular, the one being attributed to suppression of the image in the squinting eye and the other to an inherent incapacity of an apparently healthy eye to acquire normal acuity of vision in the absence of squint and no matter how early any refractive error is corrected. The poor vision in ectopia lentis

concerns both eyes; whether this is to be classed as congenital or acquired can only be decided by a careful study of cases of ectopia lentis rendered aphakic very early in life and optically corrected, e.g. within the first year of life. If the child is found to develop normal acuity of vision the amblyopia may be classed as acquired; otherwise as congenital. If the evidence is for the amblyopia being acquired, the study of older cases rendered aphakic and corrected will reveal up to what age the macular region retains the capacity to preponderate and attain normal acuity.

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A CASE OF CONGENITAL MIOSIS

BY

THOMAS H. CRESSWELL, D.O.(Oxon.)

LINCOLN

A RECENT paper by S. Holth and O. Berner on congenital miosis appeared in this journal (*Brit. Jl. of Ophthal.*, p. 401, 1923). A patient in whom this abnormality was present has recently come under my observation at the County Hospital, Lincoln, and was shown at a meeting of the Midland Ophthalmological Society.

The patient was a man of 57 years of age, one of a family of seven. He knew that his eyes were peculiar and also that he was the only member of his family so affected. He added that when nine months old he suffered from smallpox and that his mother had suggested that the condition of his eyes might be due to this disease. At the same time that he had smallpox he had had several severe abscesses on the top of the head. These have left several deep star-shaped scars into which it is possible to insert the tip of the finger and which are adherent to the calvarium. The possibility of these scars being the result of specific gummatous periostitis has not been lost sight of, but receives no support from the patient's family and personal history or general condition. He had always considered that he had good sight, had no difficulty in going about at night and had never suffered from headaches.

On examination the pupils did not react to light nor to convergence. Seen through a loupe there was possibly a very faint movement of the pupillary margin on exposure to a bright light. Both pupils were roughly circular in shape. Their sizes with and without mydriatics were as follow:

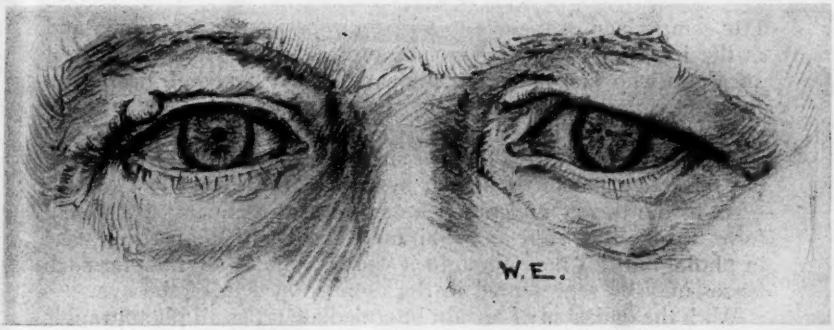
	Right.	Left.
	2 mm.	0.75 mm.
With cocain	3 mm.	1.5 mm.
With homatropin	5 mm.	2.25 mm.

When the pupils were dilated the media appeared clear and no pigment deposits were visible on the lens capsule.

Hypermetropia of about 2.5D was present in both eyes and the vision with this correction was 6/6 in each eye. Small print could be read without the aid of any glass.

The anterior chambers were shallow but the tension was normal and the fields for white were full.

Each iris appeared to consist of a thin membrane made up of closely set radial fibres of varying shades of light green. The



fibres themselves were straight and not undulating. Resting on the surface and clearly dividing it into pupillary and ciliary zones was the circulus iridis minor. The circulus was of a bright yellowish brown colour, while the pupillary zone was overlaid with structureless splodges of pigmented material. These splodges were quite thin, permitting the radial fibres to be seen through them, but were sufficiently marked to give the pupillary zone a brilliant yellowish brown colouration. External to the circulus were less marked intermittent splodges of similar material and colour laid down to form spokes or concentric circles. These spokes or concentric circles did not reach quite to the periphery of the iris; their arrangement was regular and similar in the two eyes, and they served to give the irides what little relief they possessed. No trace of contraction folds could be seen on the left iris before or after dilatation. On the right one, however, a slight fold could be seen on the outside which became more marked with dilatation.

It appeared incomplete but formed a considerable segment of a circle.

The above description applies chiefly to the left iris. The departure from the normal was less marked in the right eye. The writer believes this to be a case of congenital miosis of varying degree in the two eyes, and due probably, having regard to the findings of Holth and Berner, to developmental faults in the dilator muscle.

THE EYE AND PHOTOGRAPHIC LENSES

BY

V. C. VERBITZKY

ASSISTANT IN THE UNIVERSITY OPHTHALMOLOGICAL CLINIC, ODESSA

THE comparison of the eye to a camera obscura is an old one, and as the inventor of the camera obscura is unknown, so also is it uncertain who first made the comparison. It may well have been either Giambaptista della Porta, Leonardo da Vinci, or even an earlier observer, the Benedictine Friar, Dom Ponrince[1]. The comparison can only have been superficial and did not deal with the refractive media or optical system of the eye.

As in the theory and practice of optical instruments no special form of lens has been more minutely dealt with than those used in photography I have thought it worth while to see how far such lenses may be represented in the dioptric system of the eye.

With the omission of certain intermediate types all photographic lenses may be divided into four principal groups[2, 3].

(1) *Portrait lenses.*—These give maximum light transmission and have apertures *f*/2.5, *f*/3, *f*/4.5. In this form of lens the number of refractive surfaces in contact with air is either 8 or 6.

(2) *Universal lenses.* — The maximum light transmission through this type of lens approaches that of the first group, the minimum amount that of the following one. They have apertures of *f*/4.5, *f*/7, *f*/9, *f*/12. The number of refracting surfaces is either 6 or 4.

(3) *Wide-angled lenses.*—These have apertures of *f*/12, *f*/18, *f*/30. The number of refractive surfaces is not more than 4.

(4) *Simple landscape lenses.*—These have a relative aperture of *f*/12 and lower, and 2 refracting surfaces.

The corrected schematic eye of Gullstrand[4], which I consider one of the best schematic eyes hitherto suggested, has 6 refractive surfaces and a relative aperture in the "working pupil" (4 mm.) of *f*/5.7. In the dilated pupil (6 mm.) the aperture is *f*/3.8, and in the contracted pupil (2 mm.), *f*/11.4.

In my reduced eye[5, 6, 7, 8] with pupils 4 mm., 6 mm. and 2 mm. in diameter the relative apertures are $f/5.95$, $f/3.97$, and $f/11.9$ respectively. Thus taking round figures for the two schematic eyes the relative apertures are $f/6$, $f/4$, $f/12$. From this we may

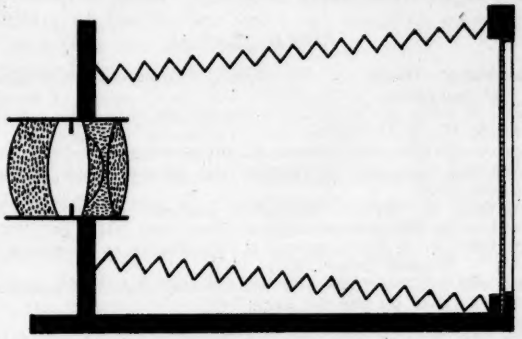


FIG. 1.

The photographic camera with Rodenstock's objective "Imagonal."

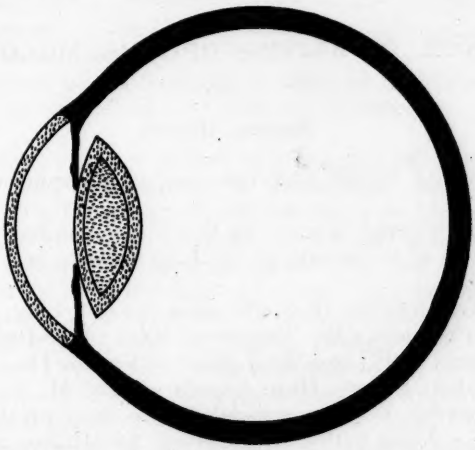


FIG. 2.

The schematic eye of Gullstrand.

deduce that the optical system of the eye resembles that of the universal type of lens. The accompanying plate illustrates the comparison. Fig. 1 is a diagram of a photographic camera with a lens of this type (Rodenstock's Imagonal with a relative aperture $f/6$), while Fig. 2 represents Gullstrand's schematic eye. The

anterior single lens of the photographic lens corresponds with the refractive system of the cornea while the posterior compound lens is represented by the crystalline lens enclosing a denser nucleus.

I desire to express my gratitude to Professor Filatow for the suggestion of this comparison.

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COUNCIL OF BRITISH OPHTHALMOLOGISTS

Annual Report

THE Council of British Ophthalmologists presents its report for 1923-1924.

The Council deeply regrets the loss it has sustained through the deaths of two of its members—Sir John Tweedy and Mr. Sydney Stephenson.

At the first meeting of the Session the following officers were elected:—President: Mr. Treacher Collins; Vice-Presidents: Sir George Berry, M.P.; and Mr. J. Herbert Fisher; Hon. Treasurer: Mr. J. Herbert Fisher; Hon. Secretary: Mr. M. S. Mayou.

The following members were elected to serve on the Executive Committee.—Messrs. Fisher, Lawford, McMullen, Sir John H. Parsons, with the President and Secretary, *ex officiis*.

The Committee which is engaged on the Standardization of Test Types has not yet issued its report.

The Committee which was appointed to deal with the Standards of Vision of Scholars and Teachers in Council Schools has presented its report, which has been published.

The Imperial College of Science and Technology invited the Council to nominate representatives to serve on its Technical Optics

Committee. The invitation was declined because instruction to opticians in diseases of the eye is sanctioned by the Technical Optics Committee at the Northampton Polytechnic Institute.

An interim report has been published by the Council on the administration of medical (optical) benefits by Approved Societies. The Ministry of Health has been requested to meet a deputation of the Council to discuss the matter.

The Council has had its attention drawn by certain ophthalmic hospitals in London to the fact that applications are made to them for certificates of visual capacity by candidates for public carriage police licences. The Council is of the opinion that provision of these certificates is not part of the duties of the medical staffs of such charitable institutions. A conference to discuss this question has been arranged with the traffic authorities of Scotland Yard.

A Committee appointed to inquire into the advisability of establishing Institutional Treatment for Interstitial Keratitis has presented its report.

Correspondence between the Council of British Ophthalmologists and the General Medical Council, on the question of Teaching and Training of Medical Students in Ophthalmology has been published.

The expenses of the Council have been defrayed as in former years by its members.

The Council has to thank the Council of the Royal Society of Medicine for the use of its rooms for its meetings.

The above report was read at a meeting of British Ophthalmologists held at Glasgow, in connection wtih the Annual Congress of the Ophthalmological Society of the United Kingdom, on May 2, 1924, and its adoption was carried unanimously.

The President then informed the meeting that since the report was written an interview had taken place between representatives of the Council, and Sir Arthur Robertson, the Secretary of the Ministry of Health, and Sir Walter Kinnear, the Controller of its Insurance Department, with reference to the Council's report on the administration of optical benefits by Approved Societies (*vide* BRITISH JOURNAL OF OPHTHALMOLOGY, Feb., 1924, page 61). The representatives of the Ministry of Health expressed themselves as desirous of having these optical benefits established on a satisfactory basis, and if possible in accordance with the schedule issued by it and quoted in the Council's report. They drew attention to the arrangements and scale of fees which had been agreed upon for the administration of dental benefits, and asked the Council's representatives if they thought that there were sufficient medical men trained in ophthalmology to carry out such work in connection with the Approved Societies, if a similar

arrangement and scale of fees were agreed upon for the administration of an ophthalmic benefit.

The President told the meeting that he had already received assurance, from a body of medical men skilled in refraction work in London, that they were prepared to carry out such work there, and would do so for members of Approved Societies at a reduced fee.

Representatives from the following towns: Bristol, Birmingham, Glasgow, Leeds, Manchester, and Wolverhampton, who were present at the meeting, stated that in their districts they considered similar provision could be made. It was pointed out by some of the speakers, that if provision could be made for refraction work in this way, great relief would be afforded to the at present over-crowded out-patient departments in hospitals.

Finally, the following resolution, proposed by Mr. Harrison Butler, and seconded by Mr. Clegg, was agreed to:

"That this meeting of ophthalmic surgeons considers that there are sufficient numbers of medical practitioners competent to carry out ophthalmic work in connection with the Approved Societies, and approves of the line of action which is being adopted by the Council of British Ophthalmologists in the matter with the Ministry of Health."

The meeting further requested the Council to confer with the Ophthalmic Committee of the British Medical Association, which also has the subject under consideration.

ANNOTATION

Miners' Nystagmus and the Compensation Act

A lengthy letter on this subject was published in the *British Medical Journal* of March 23, 1924, over the signature of Mr. A. S. Percival of Newcastle-upon-Tyne.

Mr. Percival has had a long experience in one of the most important coal mining areas of this country and his views on the matter cannot be overlooked. The object of these remarks is not "to take coals to Newcastle," but to open a correspondence in this journal, in order to place our readers in possession of the opinions of all ophthalmic surgeons who have special knowledge of the disease, for outside the mining districts, ophthalmic surgeons see very few examples of this condition.

Mr. Percival has been indefatigable in collecting and tabulating information; thus, in the *British Medical Journal* (May 8, 1923) he gave statistical evidence based on the condition of 43,684 under-

ground workers in his district which "conclusively demonstrated that in the two Northern Circuits, deficiency of light was not the essential factor in the production of nystagmus." He found that electric light is the sole illuminant used at the Plenmeller Pit and at the South Moor Colliery. In the former of these "in 1922 nearly 4.3 per cent. acquired the disease among the hewers, and 1.3 per cent. among the non-hewers—that is the percentage of hewers affected was 4.7 times greater, and that of non-hewers was 5.5 times greater where electric lamps only were used." At the latter colliery "twenty-five years ago electric lamps were used solely and the percentage of their nystagmus cases was notoriously high; but on abolishing electric lamps and installing oil safety lamps, they had no cases of nystagmus among the non-hewers and hardly any among the hewers."

Mr. Percival insists that any pitman who has once had nystagmus from which he recovers after a period of rest followed by surface work will most certainly have a recurrence if he ever returns to hewing. It is his firm belief that "a certain percentage, say four or five per cent. of all children, has a predisposition to the disease at birth; if this idiosyncrasy is absent, they will never acquire nystagmus, but if they have this predisposition, they have it for life." "The Workmen's Compensation Act," he says, "is fundamentally unjust as far as nystagmus is concerned. Practically it means that the patient receives whole or part compensation for the rest of his life; for there are few workmen who are wise enough to seek other employment."

If a workman has acquired nystagmus it shows, in Mr. Percival's opinion, that he is unfit for coal hewing. He suggests that a nystagmus patient who reports himself within six weeks of his first noticing symptoms, should after examination and corroboration by an independent referee, who is really familiar with the disease, immediately be given a liberal compensation payable fortnightly for a period not exceeding one year, in order to give him time to recover and learn some other trade. "Special consideration should be given to those who acquire the disease late in life, as they will find it harder to get new employment." But, before compensation is given the workman must sign a declaration that he will never seek employment at a colliery again, this declaration being kept and filed by the colliery manager. Any workman when first obtaining employment should be examined, a note made of his sight in each eye and any defect recorded on a "health card"; this card to follow the man throughout his working life, and accidents and any disease to be noted on it as they occur.

"The present Compensation Act has done nothing to check the disease. The numbers increase every year." Underground work (hewing) is more profitable than surface work, and the pit villages

are hotbeds of the disease, a sort of vicious circle being formed from father to son.

Our previous annotations on miners' nystagmus dealt with the First and Second Reports of the Committee and will be found in Vol. VI, p. 262 and Vol. VIII, p. 63.

For our own part we think that the evidence in favour of the now generally accepted theory of the fundamental causation of miners' nystagmus in deficient illumination at the pit face is overwhelming, but we are equally of opinion that there is a strong psycho-neurotic element which has not yet received sufficient attention, even by the Miners' Nystagmus Committee itself. There can be little doubt that it is this factor which is essentially responsible for the enormous expenditure in compensation.

Whether Mr. Percival's opinion that the surest way of checking the increase of the disease lies in clearing out the pit villages of all predisposed to nystagmus is or is not correct, it seems hardly practicable at the present time, when unemployment is rampant in all trades and in the face of so much industrial distress throughout the country.

ABSTRACTS

I.—DEVELOPMENT

(1) **Lo Cascio, Dr. G. (Rome).—The development of the sheath of the optic nerve in man. (Lo sviluppo delle guaine del nervo ottico nell'uomo.)** *Annal. di Ottal.*, Nov.-Dec., 1923.

(1) **Lo Cascio** begins his paper with a critical review of the work of previous observers, notably that of Falchi and Seefelder. A useful bibliography accompanies the paper. He has himself examined some thirty embryos, the earliest of which had a length of 26 mm., as well as numerous infantile and adult eyes. Methods of staining were those of Mallory, Calleja and van Gieson.

His conclusions are as follow:

The development of the sheath of the optic nerve begins at the end of the first half of the third month of intrauterine life, at which time there is already obvious indication of the sclera.

In embryos at the beginning of the third month (28.8 mm.) the optic nerve is imbedded in the mesoblast contained in the orbital muscular cone, without any indication of the differentiation of that tissue which is the prelude to the formation of the sheath of the optic nerve.

The first indication of a sheath to the optic nerve is found in embryos of 38 mm., in which, in correspondence with the angle

formed between the optic nerve and the secondary optic vesicle, while the inner layers of the scleral beginning push down to the periphery of the optic nerve, where they stop, the external layers are bent back proximally, covering a short distal tract of the optic nerve, where they become continuous with a small layer of mesoblastic tissue, somewhat more compact, derived from the remaining muscular cone. That layer of mesoblastic tissue, which surrounds the optic nerve, is formed from two or three rows of elongated cellular elements, with flattened nucleus, which form an embryonic mantle to the optic nerve.

That is the *first indication of the sheath of the optic nerve,* and since it subsequently differentiates into all three parts of the adult sheath, it may be appropriately called the *common primitive meningeal sheath.*

The first indication of a differentiation of this primitive sheath is to be seen in embryos of the second half of the third month (45 mm.), a period at which in the layers of the sheath which lie close to the optic nerve, small blood-vessels make their appearance running on the surface of the nerve itself, mainly in a longitudinal direction; this more internal and vascular part of the primitive sheath represents the first stage of the development of the pial sheath. At this stage of development, therefore, the optic nerve sheath is formed of two layers, a vascular inner layer closely applied to the optic nerve, the embryonic pial sheath, and an external portion which represents the common origin of the dural and arachnoid sheaths.

Towards the end of the third month (86 mm. embryos) the structure of the sheaths is somewhat increased in thickness, and new mesodermal elements make their appearance in direct connection with the external layers of the primitive sclera and are laid on the back of the older layers of the primitive sheath.

The primitive sheath undergoes further differentiation in the fourth month. In foetuses of the first half of the fourth month a conspicuous rarefaction of the intermediate layers is apparent, so that in the primitive sheath, in addition to an external or dural and an internal or pial portion, an intermediate portion may be distinguished formed of trabeculae, which in the distal part become continuous with the intermediate layers of the sclera. This trabeculated portion is richer in the distal tract of the sheath, while in the proximal part there is only formed a slender framework made up of two or three much elongated cellular elements which reach from the internal surface of the dural sheath to the external surface of the pial sheath.

These trabeculae evidently represent *the origin of the arachnoid,* and, together with the lacunae interposed between the framework, the *primordial intervaginal space.*

The beginning of an endothelial covering of the walls of the intervaginal space is first observed in foetuses of 130 mm.

Up to the sixth month inclusive of intrauterine life the arachnoid is represented by trabeculae; a true and proper arachnoidal lamella is only found in foetuses of the seventh month.

In the foetuses of the seventh month the double endothelial covering of the dural sheath is separated from the underlying dura chiefly in the proximal part, until in foetuses of the eighth and ninth months there is formed a cellular lamella which has no connection with the dural sheath, but which is distally implanted in the intervaginal *cul-de-sac*, and internally is in connection with the pial sheath through the intervaginal trabeculae. This is the *lamella arachnoidea*, which, as has been seen, is developed at the expense of the internal layers of the dural sheath.

It is evident from this research that the sheaths of the optic nerve develop in a manner analogous to that of the cerebral meninges, and that also in the case of the optic nerve sheaths we are unable to accept the views of certain workers, who would claim an ectodermal origin for the meninges, wholly as Tiedmann, Bischoff, or partially as Remak, Reichert, Rathke.

The sheaths of the optic nerve have an origin exclusively mesodermal just as Salvi has shown to be the case in the spinal and cerebral meninges. At the expense of the mesoderm surrounding the embryonal optic nerve there is first developed a primitive common sheath from which the adult sheaths are subsequently differentiated.

The first to be differentiated is the pial sheath (second half of the third month); the intervaginal trabeculae are developed at the expense of the intermediate layers of the common primitive sheath, while the arachnoid lamella is differentiated later from the more internal layers of the dural sheath.

Lo Cascio, in the careful account given of his various observations, notes several other points of embryological importance besides those connected with the sheaths and illustrates his paper with three beautifully reproduced plates of microscopic drawings.

E.E.H.

(2) **Maggiore, Dr. L. (Rome).—The development of the scleral canal and of the lamina cribrosa in the human eye. (Lo sviluppo del canale sclerale e della lamina cribrosa nell'occhio humano.)** *Annal. di Ottal.*, Sept.-Oct., 1923.

(2) **Maggiore** draws attention to the very special importance of the development of the human lamina cribrosa in connection with some of the problems of glaucoma (see Fuchs, *Arch. f. Ophthal.*, 1916, abstracted *Brit. Jl. of Ophthal.*, 1918, p. 50). He

discusses the literature of the subject at some length and gives a bibliography.

In his own investigation he made use of the staining methods of van Gieson, Weigert and a method of silver impregnation described by Hortega, the last of which he has found specially useful in differentiating the connective tissue system from the glial. His conclusions are as follow:

The lamina cribrosa in the human eye is scarcely apparent before the middle of the seventh month of intrauterine life, after which period it takes on a definite form in relation to the optic nerve, sclera and optic nerve sheaths. In embryos of the third month the mesodermic tissue surrounding the trunk of the optic nerve and the pigmented folds of the secondary optic vesicle is little differentiated; the sclera is represented in the posterior segment of the eye by a thickening of the tissue corresponding to the external surface of the pigmented fold of the retina and surrounds the optic nerve. Nevertheless, the first delimitation of the scleral canal is to be seen at this stage with a well-defined anterior but no posterior limit. The nervous tissue of the optic nerve in the whole extent of the tract that may be considered intrascleral is in direct contact with the tissue of the sclera. In embryos of the second half of the third month and still more a little later, in connection with the perioptic edge of the external retinal fold, the beginning of a small cellular neck makes its appearance which is gradually insinuated more deeply between the surface of the scleral canal and the trunk of the optic nerve. This formation is of glial origin and is called the peripheral glial mantle. All the cells of this glial mantle are connected with prolongations of the interstitial glial cells of the optic nerve. During the fourth month of intrauterine life the scleral tissue marks out a small space, more or less oval, which completely surrounds the optic nerve round the peripheral glial mantle and corresponds with the margin of the pigmented retinal fold. This space may be called the perioptic annular space, and allows the optic nerve to lie in the more external part of the scleral canal independent of the sclera itself. At the same time the development of the optic nerve sheaths has progressed to the delimitation of an intravaginal space, so that the more external part of the sclera in connection with the dural sheath is no longer in contact with the optic nerve but remains separated by the space formed between the dural and pial sheaths. By the beginning of the sixth month there is no longer any intimate connection between the scleral tissue and the optic nerve. At the end of the sixth month, when the first indication of the lamina cribrosa may be considered apparent, in so far as the connective tissue derived from the sclera in the foraminal tract has joined up with the processes originating from the adventitial tissue of the

central vessels of the optic nerve, a sufficiently definite limit is established between the more internal part of the intrascleral tract of the optic nerve and the external part which is directly continuous with the extrabulbar tract of the optic nerve. This primary rudiment of a lamina cribrosa has so far only a virtual significance as it is not until the eighth month that a definite fibrous laminar portion begins to appear which even then scarcely deserves the title of lamina cribrosa. Thus the development of the lamina cribrosa only takes place at a comparatively late period of intrauterine life in agreement with the late histological differentiation of the optic nerve, in which it has been noted that the formation of the myelin sheaths is only completed in the first days of extrauterine life. The lamina cribrosa actually represents a sharp limit between the non-myelinated and the myelinated portions of the optic nerve fibres; this supports the hypothesis that, owing to its antecedent development, it acts as an effective barrier to the spread of the myelin sheaths to the distal extremity of the optic nerve fibres.

There are four beautifully reproduced coloured plates to illustrate the paper as well as two diagrams in the text. This paper in conjunction with that by Lo Cascio, also noticed in this number of THE JOURNAL, should be of great assistance to any workers on ocular embryology.

E.E.H.

II.—CATARACT

(1) **Roper, Arthur C. (Exeter).—Two series of cases of cataract.** *Lancet*, April 1, 1922.

(1) Not every series of statistics of operative results bears the stamp of impartiality, one might almost say of honesty. The series here recorded gives one the impression that the operator has endeavoured to show every bad result as clearly as every good one. The article is condensed and there is not much that can be taken from it for comment beyond the fact that the statistics show a not inconsiderable number of visual results of 6/60 or less. In 6.49 per cent. of the 489 cases (each eye being apparently a "case") there was no resulting vision, but, as the author says: "The cases are consecutive, all are entered, and many were done on the off-chance of getting some sight—for example, several cases of lens opacity coming on after irido-cyclitis, a very common disease in these parts of the country." There is risk of confusion in what **Roper** has to say about irido-cyclitis. In the quotation just given he is speaking of cataract the result of irido-cyclitis, while further

on in the article, he says: "The disease (i.e. irido-cyclitis) is so common in Devon, especially in low-lying, damp and foggy districts, that it seems reasonable to suppose that a trauma, such as a cataract operation, might start it in a person previously disposed to it." This is said in disagreement with the opinion of Morax as expressed at the last Oxford Congress, that irido-cyclitis after cataract extraction is due to faulty technique. Roper regards it as "mostly an auto-infection."

ERNEST THOMSON.

(2) **Barkan, H.—Cataract extractions performed by Prof. Josef Meller, of Vienna, 1919-1921.** *Jl. of the Amer. Med. Assoc.*, Dec. 22, 1923.

(2) **Barkan** reviews 249 cases operated on by Prof. Meller during these years. He calls attention to the difficulties with which Meller had to contend in the absence of all, or nearly all, the advantages which the clinic had possessed before the war; the instruments were bad; the wards and operating theatre could not be properly warmed; the food was bad and the patients half starved before admission; few preliminary examinations could be made and few precautions taken. In spite of this the results were good; it may be fairly said with Barkan, "surprisingly good."

Barkan separates 75 cases (30 per cent.) as complicated; among these were 17 cases of high myopia, 7 cases of diabetes, 4 of chronic glaucoma; the others were largely choroidal degeneration, which, presumably, could not be discovered before the operation.

The operation chosen was an upward incision with a small conjunctival flap, avulsion of the anterior capsule with capsule forceps, and expression of the cataract by pressure of the index finger against the lower lid; a small basal iridectomy completed the operation.

There were few complications; vitreous was lost in 5 per cent.; prolapse of iris in 1.6 per cent. Three eyes were lost.

In 81 per cent. of all the cases "a clear view of the fundus was obtained at dismissal." Barkan is of opinion that this demonstrates the value of the routine use of capsule forceps.

He states his belief that no other method would have given so good results with such poor material; whether we agree with this or not, we must agree that at least these results are very good.

H. GRIMSDALE.

(3) **Derby, G. S.—Modern aids to cataract extraction.** *Jl. of the Amer. Med. Assoc.*, Dec. 22, 1923.

(3) **Derby** of Boston, regards the method of paralysing the orbicularis, before operation, by means of injections of procain and epinephrin, into the orbital tissues, as one of the greatest aids

to the safe performance of extraction. He finds it reduces the percentage of loss of vitreous considerably.

He believes that suture of the conjunctival flap is a valuable protection against opening of the wound and prolapse of the iris. The method of Verhoeff, in which a small conjunctival flap is cut from without inwards, and a doubly armed suture passed so as to engage the sclerotic opposite the middle of the proposed section and then each lateral part of the flap, is perhaps the best; and with lid injection and complete anaesthesia, the technique is not difficult.

H. GRIMSDALE.

(4) **Sédan, Jean (Marseille).—Diabetic cataract which commenced and became completely mature in a month. (Cataracte diabétique ayant débuté et complètement muri en un mois.)** *Rev. Gén. d'Ophtal.*, August, 1923.

(4) **Sédan** relates the case of a workman, aged 50 years, who considered himself in perfect health, and who had had no occasion to consult a doctor for thirty years, but who, nevertheless, was found to be suffering from diabetes and incipient cataract. The vision had begun to appear defective to the patient only four days previously. One month after the first observation by Sédan, which took place on the fifth day of defective vision as noticed by the patient, the cataract was perfectly mature and the vision *nil*. About two months later, the sugar in the urine having begun to increase after a period of improvement, and the fellow eye, previously normal, having developed incipient cataract also, the mature cataract was successfully removed. At the time of writing the second eye had not yet been operated upon.

ERNEST THOMSON.

(5) **Cruickshank, M. M. (Capt. I.M.S.)—A note on the complications following 1322 consecutive cases of cataract extraction.** *Indian Med. Gaz.*, October, 1923.

(5) This is an interesting report written by one of the surgical staff assisting Dr. Holland at his 1923 visit to Shikarpur, in Northern Sind. Dr. Holland descends from his mission hospital at Quetta at the beginning of each year, mainly to extract cataracts from patients drawn from far and near. To share in the work he gathers such surgical help as he can get. On this occasion the operating staff varied from three to five, and there were two very expert cataract assistants and two trained sisters. The work was strenuous, lasting from January 2 to February 19, the season then being brought to an end by flies and dust. Two operating theatres were kept going constantly. The "wards" consisted of temporary shelters and brick outhouses, where the patients lived after their own fashion, surrounded by friends and relatives.

In addition to the cataract work there were 882 other eye operations performed, including 73 iridectomies for glaucoma. Holland has given up trephining, as he finds iridectomy equally effectual and safer. There were also 357 general surgical operations performed.

Owing to the limited period of work and the distances travelled by many of the patients, cataract operations can be postponed for only a very short time. For an unhealthy conjunctiva several days' preliminary treatment with silver nitrate has to suffice. Trachoma is treated in various ways, if necessary by combined excision of the tarsus; and trichiasis by a plastic operation, before the major operation is undertaken. Risks have to be taken, which would not be incurred under more favourable circumstances.

There were 1,241 intracapsular cataract extractions, and 81 with capsulotomy. The proportion of vitreous losses was high—10 per cent.—but there were only five failures to improve vision attributable to this accident. In 0.8 per cent. of cases the vitreous loss was associated with rupture of the lens capsule. The proportion of the latter accident occurring alone, without vitreous escape was 5.6 per cent. And there was 2 per cent. of iris prolapse.

There were 76 failures to improve vision among the total 1,322 operations, 5.7 per cent. Sepsis accounted for 24 of the failures, 20 of them being among the 1,241 intracapsular extractions, i.e. 1.6 per cent. Choroidal haemorrhage accounted for no less than 13 failures, i.e. 1 per cent. (it is not stated whether they were all among the intracapsular operations). This very high proportion of destructive haemorrhage was attributed to operating upon glaucomatous eyes. (In India plus tension produced by swollen lenses is very much more frequently seen than in this country, since the rapid formation of cataract, with softened liquefying cortex is much more common there.) These haemorrhages led to the regular use of the tonometer in the later part of the season, only one of these accidents occurring after this precaution was adopted. Extraction within the capsule was still performed when the rise of tension was moderate, i.e. below 50 (McLean); but when the tension was higher than this, iridectomy was performed, the subsequent treatment depending on the result of the iridectomy.

An interesting feature of the work was the trial given to Barraquer's operation by Dr. W. A. Fisher of Chicago. Of eighteen operations performed by this method fifteen were without complication. The trial could not be continued owing to the pneumatic vibratory machine getting out of order.

A passing reference is made to the "boat-shaped pupil which too frequently follows extractions of the lens in its capsule."

H. HERBERT.

III.—DETACHMENT OF RETINA

(1) **Darier, A. (Paris).—Retinal detachments which become cured. (Les décollements rétiniens qui guérissent.)** *La Clin. Obhtal.*, January, 1920.

(1) Darier, ever optimistic, attacks the statistics of retinal detachment, and more especially those of Vail with his figure for the United States of one in one thousand cured. He gives some figures of his own during the last six years, which give a percentage of 16.27 per cent. cured and 25.55 per cent. improved. This is a little better than his own figure for twenty years which was 10 per cent., but the numbers are relatively small, namely, 60 treated 1903-1913 and 43 cases (not all actually treated) in the past six years. Leaving on one side the simple rest treatment which is sufficient for many traumatic cases, Darier has come to a routine treatment in cases of myopic detachment. This consists in rest in bed with light compression, subconjunctival injections of acoinated gelatinized serum followed by the addition of saline to these injections, and if improvement does not become noticeable after the first or second injection, scleral puncture. At the same time syphilis and tubercle should be combated in the manner appropriate to each.

ERNEST THOMSON.

(2) **Benedict, W. L., and Mussey, R. D.—Detachment of the retina in a case of pregnancy with nephritis. Re-attachment with restoration of vision.** *Amer. Jl. of Ophthal.*, Vol. VI., No. 4, April, 1923.

(2) This is an interesting case reported from the Mayo Clinic which occurred in a primipara, aged 25, of about seven and a half months' gestation. Evidence of renal trouble had been present for some months, such as oedema, and the presence of albumen, red blood cells, hyaline casts and pus cells in the urine; the albumen had disappeared from the urine after the fifth month under treatment, but had recurred just before the case was admitted to hospital. Visual disturbance was complained of very soon after admission to hospital; the first sign found in the fundus was a patch of oedema in the right retina, with a few scattered small pale dart-shaped areas in the choroid of the same eye, the other eye being at this time free from signs of disease; the nasal field of the affected eye showed some contraction. On the following day, a massive retinal oedema had appeared, with apparently an early detachment, the pale choroidal areas had increased in number, the nasal field was more contracted, the disc was normal and there were no haemorrhages. On this day the left eye first showed spots in the choroid, similar to those already observed in

the right eye, but at this time there was no contraction of the left field; on the next day the oedema in the right eye was more generalized; as it increased, the choroidal spots disappeared, and a patch of oedema had made its appearance in the left eye.

Labour was induced and a healthy boy was born alive. On the day after delivery, lobulated detachment of the retina was present in each eye, the oedema was beginning to clear up and vision was reduced in each eye to inability to count fingers. The condition gradually improved, the detachments subsided and the oedema cleared up; by the end of a fortnight after delivery, the retinae had become replaced, and by the eighteenth day the oedema had gone and vision of 20/33 was recorded.

R.R.J.

(3) **Delorme, Dr. (Clermont-Ferrand).—Detachment of the retina in a myope cured by cauterisation of the anterior segment of the globe. (Un décollement rétinien myopique guéri par le colmatage du segment antérieur.)** *Arch. d'Ophtal.*, March, 1923.

(3) The patient was a man, 32 years of age, with myopia of 12D. The vision of his right eye had failed spontaneously five days previously. The detachment was situated below but extended upwards on the nasal side. Vision with $-12D = 2/10$. On May 14, 1919, "colmatage" or calfeutrage," i.e. scarring of the episclera after dissecting up the conjunctiva in the perilimbal region was performed under local anaesthesia. The conjunctiva was then replaced and sutured. Atropin and a compress were applied.

The immediate result was a rise of tension to +1, gradually subsiding to normal.

Six weeks after the operation the ocular tension was normal, the previously detached retina was completely replaced, the visual field was "very good," and vision $= 4/10$. For a period of $2\frac{1}{2}$ years the eye retained the same visual acuity and there was no return of the detachment. Both eyes then developed choroido-retinitis, which destroyed central vision and was followed by a recurrence of detachment of the retina. This method of treating ocular hypotonus had been previously advocated by Pesmé of Bordeaux, and the technique had been described by Lagrange in his book on "Glaucoma and Hypotony."

J. B. LAWFORD.

(4) **Bettremieux (Paris).—Retinal detachment and non-perforating pericorneal sclerectomy. (Décollement rétinienne et sclérectomie peri-cornéenne non-perforante.)** *La Clin. Ophtal.*, September, 1923.

(4) **Bettremieux's** communication was made to the Ophthalmological Society of Paris, July 7, 1923. There are no optimistic

statistics, he says, regarding the treatment of retinal detachment. That is profoundly true, but Bettremieux is optimistic regarding his method of sclerectomy which acts, he says, by making an anastomosis between the subconjunctival vessels and the pericorneal intrascleral plexus of veins, thus greatly improving intraocular nutrition. Now, the three causes of detachment (? spontaneous detachment) are myopic ectasia, senility and foci of anterior choroiditis, and these result in nutritional troubles of the uvea. It is not surprising, therefore, that non-perforating sclerectomy should be a good operative treatment for detachment.

The steps of the operation are briefly as follows, it being understood that the operation should be performed immediately after the onset of detachment, or, according to Boucheron, before the sixth day. Under cocain and adrenalin (the latter on account of the free bleeding which occurs) a conjunctival flap is dissected up from the limbus and has a width of 15 to 18 millimetres. The sclera is bared. With a sclerectomy forceps and a fine Graefe knife shavings are taken from the limbal sclera for a distance of 12 to 15 millimetres in such a way as to make a groove (one gathers from the drawing that it is about 1 mm. wide), of that length. The conjunctival flap is freed by two cuts at right angles to the original incision along the lower limbus and brought up to cover the wound in the sclera by two vertically placed sutures. The operation can be repeated several times in the same eye (presumably at different parts of the limbus, though this is not stated).

No statistics are offered but apparently the author has practised the operation at least since 1910, for in the year 1912 he presented a case of detachment in a high myope thus operated on to the Belgian Ophthalmological Society. This case had been under observation for two and a half years and remained cured. At the same meeting he presented another case of the same kind which had remained cured for less than two months, but which has been seen frequently since and has remained well for eleven years.

While one gathers that an essential for the treatment is the earliest possible operation, a condition by no means always easy to obtain, good results obtained by an ophthalmic surgeon of such high standing are at any rate very encouraging. But it is not the surgeon's fault if patients delay to seek advice or refuse operation when offered. There are many other eye troubles in which the same difficulty occurs. The general public still requires a great deal of education of a physiological and hygienic kind.

ERNEST THOMSON.

IV.—MISCELLANEOUS

(1) **Brandes (Antwerp).—Regarding a case of uniocular macular choroido-retinitis of ethmoidal origin occurring in a syphilitic female patient. (A propos d'un cas de chorio-rétinite maculaire monoculaire d'origine ethmoidale chez une syphilitique.)** *La Clin. Ophtal.*, June, 1923.

(1) The outstanding fact of the case reported by **Brandes** (the fourth case of the kind reported by him) is that a peculiar appearance at the macula indicated to him that the patient was suffering, not from a syphilitic manifestation in the retina, although she was known to be syphilitic, but from an infection of ethmoidal origin. Further, this diagnosis enabled Brandes to send the patient to a rhinologist with the definite instruction that he wished the ethmoidal cells to be opened. This was done, pus was found and the vision which apparently had been *nil* was progressively recovered up to 2/3.

The case was that of a syphilitic woman of 48 years who was found to have a recent macular choroido-retinitis of the left eye "having the same ophthalmoscopic characters as described by me on a former occasion in connection with three cases presented to the *Société française d'Ophtalmologie* in May, 1922." Brandes has given the name "leopard's skin" choroido-retinitis to the condition, which consists of "little round patches of a colour which varies from reddish brown to yellowish brown with, in the centre, a little mass of pigment." It is to be understood, the writer says, that this picture refers to acute and quite recent cases only. After the operation on the ethmoidal cells—how long after is not stated—there remained only a few little islands of pigment in the retina: "On account of the very early surgical intervention the foci of choroido-retinitis have not had time to reach the stage of atrophy."

The reviewer feels called upon to remark upon the extremely careless proof reading which one sometimes finds in French publications. In the article at present under consideration, in the table showing the visual acuity at various dates, the year 1922 is represented as having thirteen months, and following 23/13/22 comes 10/2—(no year) so that one is left in doubt as to how long it took for the visual acuity to reach 2/3.

ERNEST THOMSON.

(2) **Lohmann, W.—The origin of angioid streaks. (Zur Genese der Pigmentstreifen der Netzhaut.)** *Arch. f. Augenheilk.*, Vol. 90, Parts 2 and 3. 1922.

(2) **Lohmann** says that there have been no satisfactory anatomical examinations of this condition. He will not admit

Lister's case because, he says, no previous ophthalmoscopic picture could be produced. The three suggested origins of the streaks are briefly discussed:—(1) Haemorrhage; (2) a puckering of the membrane of Bruch and the pigment epithelium; (3) true vessels originating in the choroid (Lohmann regards this as the least likely). Lohmann thinks that loss of elasticity of the membranes lies at the root of the condition. Resulting from this there is a tendency for the choroid and retina to shrink together, which produces fissures. These fissures become filled with blood components and derivatives, and atrophic changes in the choroid follow. In conclusion the right and left eyes of a patient with angioid streaks are described and depicted.

JAMES FISON.

(3) **Siegrist, A. (Bern).—The Effect of concentrated alkalis and acids upon the eye. (Konzentrierte Alkali- und Sauerwirkung auf das Auge.)** *Zeitschr. f. Augenheilk.*, Vol. XLIII, 1920.

(3) This paper by **Siegrist** deals with the effect of concentrated acids and alkalis upon the eye, and it treats the subject both from its clinical and experimental sides. The author has carried out a research upon rabbits chiefly to determine how far lavage with water or a neutralising solution will influence the severe damage which invariably attends this class of accident.

Several cases are narrated in detail and full justice is done to previous work upon the same subject.

Clinical experience shows that these strong re-agents not only cause a rapid and very destructive action upon the cornea, but that they also induce intense irido-cyclitis and cataract.

The first experiments were made upon three young and three adult rabbits. A drop of sal-volatile was instilled into the eye, and nothing further was done except to wash out the eyes twice daily with boracic lotion. All twelve eyes were totally destroyed. After twelve hours, before the cornea was ulcerated, a hypopyon appeared with intense iritis. Then the cornea ulcerated and sloughed. The pathological examination of the resulting material is described in some detail. The leading feature was the intense action upon the cornea and the inflammation of the iris and ciliary body.

Similar experiments were made with a drop of concentrated nitric and hydrochloric acid. Both acids exerted a similar action. There was a marked difference between the action of the acid and the alkali. Sal-ammoniac rapidly destroys the corneal epithelium and Bowman's membrane. Both melt into a homogeneous mass and necrose. Within 24 hours the ciliary body is inflamed and hypopyon appears. In marked constrast to this rapid deep action

of ammonia the acids exert a quick but superficial action upon the cornea. The superficial layers coalesce into a homogeneous mass which stains with eosin, whereas the deeper layers are unaffected for a considerable time. There is no early hypopyon, for the acid does not enter the aqueous in sufficient concentration to affect the ciliary body. The weak acid content of the aqueous exerts a powerful and deleterious action upon the lens capsule and causes a cataract of varying intensity. In practice this means that, if the eye be washed out at once, the effect of strong acids will not be so disastrous as that of ammonia, which diffuses so rapidly through the cornea that no treatment avails much if it be delayed over ten seconds, which is another way of saying that ammonia and sal-volatile always destroy an eye. Pickler in his paper (*Zeitschr. f. Augenheilk.*, Vol. XXIII., 1910), carried out similar experiments with liquid ammonia and arrived at the same conclusion.

Siegrist continued his experiments with rabbits to try to ascertain how far immediate treatment influenced the result. He concluded that if treatment were delayed for fifteen seconds it had no action in saving the eye.

T. HARRISON BUTLER.

(4) **Hoffe (Cologne).—Upon secondary inflammation of the eye caused by sulphuretted hydrogen. (Ueber sekundäre Augenentzündungen durch Schwefelwasserstoff.)** *Zeitschr. f. Augenheilk.*, Vol. XLIII, 1920.

(4) **Hoffe** describes a form of delayed conjunctivitis caused by inspiring air containing sulphuretted hydrogen. In a factory where sulphur is manufactured, sulphuretted hydrogen is an intermediate product, and the workmen who are engaged in the process are liable to a very painful inflammation of the eyes which comes on quite suddenly, generally when they are feeling quite well and have left work. The condition must be distinguished from direct irritation of the eyes with crystalline sulphur, with sulphur dioxide, and other irritating substances, by the fact that all these agents produce their effect at once, whereas that of sulphuretted hydrogen appears some hours after exposure. In the factory, which is furnished with the very latest hygienic appliances, the gas is produced in enormous boilers by the action of steam upon potassium sulphide and magnesium chloride, and is conducted by tubes to a gas holder where pure sulphur is obtained by Claus' method (*Röst Verfahren*). The end-product which remains in the boilers is filtered and allowed to settle in wide flat tanks exposed to the open air. In general the health of the workmen is good. Slight attacks of sulphuretted hydrogen poisoning are quite common but severe symptoms are rare. Only one fatal case has been recorded. Gas masks, protecting

spectacles, and oxygen apparatus, are always ready to hand but are employed only for exceptional work caused by a break-down in the plant. The attack generally follows a works break-down when the men have been exposed to a concentration of the gas, but those who work at the settling tanks are also liable to slight poisoning. Many men suffer from trivial general symptoms without any eye affection, but those who have ophthalmic symptoms complain of general malaise, headache, nausea, etc. The attack often begins on the way home from work, but may be prolonged for ten hours after exposure. The onset is sudden, the man may have to get off his bicycle, and grope about. The first signs are coloured rings around lights, followed by photophobia. There is a burning sensation with the feeling of sand in the eyes, lacrymation, reddening and swelling of the lids. Blepharospasm follows. There is not much injection of the globe. The pain is very severe and does not yield to cocain to any extent. In from two to three days recovery is complete. In a case observed by Hoffe there were several small epithelial opacities in the cornea which stained with fluorescein.

T. HARRISON BUTLER.

(5) **Triebenstein, Dr. O. (Rostock).—Eye diseases due to rosacea. (Die Rosazeaerkrankungen des Auges.)** *Klin. Monatsbl. f. Augenheilk.*, January-February, 1922.

(5) **Triebenstein** has collected the cases from the Rostock clinic for ten years in which the source of infection was considered to be rosacea. He points out that the disease is by no means confined to those of mature age but occurs as early as the second or third year. Previous authors (Capauners, Erdmanns) have found that the proportion of females affected was overwhelming but with this the author does not agree as he finds that one third of his cases were males. He claims that the main aim of his paper is to elaborate more sharply the clinical picture of the various forms of rosacea eye affections. These are: 1. Blepharitis with small yellowish scales which never leads to serious changes in the lids. 2. Two quite distinct forms of conjunctivitis, one more widely spread with clumps of vessels, and the other a more nodular form. 3. Rosacea-keratitis which has three typical forms; marginal keratitis, subepithelial infiltrate and progressive corneal inflammation. He lays stress on the fact that all typical rosacea affections begin with characteristic changes in the marginal vascular network of the cornea. This fact has, he believes, been previously overlooked.

In regard to treatment he finds a zinc icthyol ointment (ammon. icthyol. 0.15, zinc. oxyd. 5.0, white vaseline to 15) of most value. Early use of the sharp spoon is also of use in suitable cases.

He considers that rosacea has been considerably neglected as

a cause of corneal inflammation and even goes so far as to suggest that cases diagnosed as rodent ulcer of the cornea (Mooren) may really have been due to rosacea.

A lengthy bibliography accompanies the paper.

E.E.H.

BOOK NOTICE

Die Augenärztliche Therapie. By Dr. E. FRANK. pp. vi and 139. Berlin: Julius Springer. 1924.

This small book of some 136 pages deals only with the general and local medicinal treatment of diseases of the eye. And it may be said at once that, on the whole, it performs this function satisfactorily.

The book is divided into three main sections: (1) General treatment; (2) Local treatment; (3) Special section. Many will find the first section to be the most useful. In eight chapters it gives a condensed account of the treatment of tuberculosis and syphilis, and the various methods of treatment by means of sera; organic substances, protein and shock therapy; the use of light and other emanations; electricity, heat and cold, etc.

No attempt is made to consider critically the relative value of the different procedures enumerated. Thus, for instance, in the first chapter on tuberculosis all the different forms of tuberculosis and bacillary emulsions are enumerated. For each one the method of preparation and the average dose are given and the suitable general treatment indicated. This chapter, as well as others, is useful as summarizing shortly all the methods available leaving the choice of the particular method to be employed in any given case to the experience and predilection of the individual dealing with it. In the same way the chapters dealing with paraspecific protein and shock therapy, are useful as showing most, if not all, the substances which may be used and the manner of their employment, and the conditions for which they have been advised.

The second section on local treatment resolves itself into a long list of drugs, arranged alphabetically, with indications for use. In several instances the deleterious effect of a drug is not mentioned, as, for instance, acoin is advised as an anaesthetic to be injected before the use subconjunctivally of dionin or oxycyanide of mercury. It will undoubtedly prevent the pain of these injections, but no mention is made of its effect in causing adhesions between conjunctiva and sclera. And again, no mention

is made of the occasional irritating effect of white vaseline. Many will be surprised to find arnica in the list of drugs, and will find enumerated many synthetic preparations of which they have never heard, while the only form of salicylate mentioned is the acid which is advised to be used as an ointment in blepharitis. In spite of minor blemishes of this character, this chapter will be useful in bringing to mind many a forgotten procedure, and may lead to the more general use of some of the newer drugs with possible advantage to our patients.

The third section consists of 20 pages in which all the diseases of the eye and its adnexa are enumerated, with the treatment of each condition. This section is sketchy in the extreme.

This book can be recommended as a useful summary of all the modern methods of treatment. It is well arranged, clearly written and of small compass.

A. H. LEVY.

NOTES

Deaths

WE regret to record the death of GEORGE HENRY OLIVER of Bradford, which occurred on April 14.

DR. GEORGE DAVID JOHNSTON, who died on January 23, 1924, had practised in British Columbia for many years. He was born in London, the son of the secretary of St. Thomas's Hospital, at which institution he received his medical education. After qualifying M.R.C.S., L.R.C.P., he was for a time clinical assistant to the late Mr. Nettleship at the Royal London Ophthalmic Hospital. He settled in Vancouver in 1888, two years after the disastrous fire which practically obliterated that rising city and port. Dr. Johnston held the appointment of ophthalmic surgeon to the Vancouver City Hospital, but did not devote himself exclusively to ophthalmic surgery, being interested in surgery and taking part in the civic life of the city. He had been a member of the Ophthalmological Society of the United Kingdom since 1888.

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Honours

MR. A. L. WHITEHEAD of Leeds has been recently elected a Fellow of the Royal College of Surgeons of England, under Section 5 of the Charter of 15 Vict., relating to members of twenty years standing.

PROFESSOR VON ROHR has had conferred upon him the degree of "Doctor of Medicine" *(honoris causa)* by the University of Jena for his very important work in the field of Ophthalmic Optics and its history.

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Appointment

PROFESSOR A. BIELSCHOWSKY of Marburg has been appointed Director of the University Eye Clinic in Breslau in succession to Professor Uhthoff, who has retired.

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Errata

IN Dr. Liebermann's article on the "Localization of Foreign Bodies in the Eye" in the March number, on Page 110, five lines from the bottom of the page for "I was aware" read I was not aware, and on page 111, five lines from the bottom of the page for "sutures" read needles.

In Mr. Percival's paper on "Prescribing Spectacles" in our last number the following corrections should be made: Page 229 line 18 read "or" for of; p. 230, line 14 from bottom, read "towards" for from; p. 231, line 4, read "f_1''" for f_1; line 7 read (+6) for (+6.5); line 8 should end with (−7); line 9 should read

$$\therefore -0.001\,(D) = -0.001\,(d) + \frac{\mu}{\chi}, \text{ or } \chi = \frac{-\mu}{0.001\,(D-d)}.$$

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Ophthalmological Society Annual Congress

THE Annual Congress of the Ophthalmological Society of the United Kingdom was held in Glasgow, under the Presidency of Dr. Maitland Ramsay, on May 1-3. An account of the proceedings will appear in our next number. The Annual Dinner was held at the Central Station Hotel on May 1, and the Principal of Glasgow University held a reception in the Department of Zoology. Great hospitality was shown to the visiting members of the Society by the ophthalmic fraternity of Glasgow.

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Optical Benefits

A COMBINED meeting of the Council of British Ophthalmologists and representatives of the British Medical Association was held at the Royal Society of Medicine on May 14 to discuss the question of optical benefit administered by approved societies. It was decided to appoint a Joint Committee to deal with the matter.

FUTURE ARRANGEMENTS

June 3.—Midland Ophthalmological Society, at the Coventry and Warwickshire Hospital.

June 12-14.—Deutsche ophthalmologische Gesellschaft, at Heidelberg.

June 13.—Royal Society of Medicine. Section of Ophthalmology (Annual Meeting).

July 2-5.—Oxford Ophthalmological Congress.

The Doyne Memorial Lecture will be delivered by Dr. T. Harrison Butler on "Focal illumination of the eye, with special reference to the clinical use of Gullstrand's Slit-Lamp." A Discussion will be held on "The general principles of the treatment of convergent concomitant strabismus" (excluding details of operations) to be opened by Dr. E. Landolt of Paris and Dr. Ernest Thomson of Stirling. A discussion on "Medico-legal Ophthalmology" will also be held.

July 22-25.—British Medical Association. Ninety-Second Annual Meeting at Bradford. Section of Ophthalmology. President: A. Maitland Ramsay, M.D.; Vice-Presidents: R. J. Coulter, M.B., A. L. Whitehead, M.B.; Hon. Secretaries: J. D. McCulloch, M.B., Humphrey Neame.

September 1-6.—Course on the slit-lamp at the Ophthalmic Clinic of Zürich.

In answer to a number of applicants who could not be accommodated last year, Professor Vogt will hold a course in slit-lamp work, combined with demonstrations of the fundus in red-free light, from September 1 to 6, inclusive, 1924. The programme will be the same as that of last year. The number of students to be admitted to the course is limited.

Application should be made to Professor Vogt, Universitäts Augenklinik, Zürich.

October 7.—Midland Ophthalmological Society (Annual Meeting) at the Birmingham and Midland Eye Hospital.